

TH

**Notice of Allowability**

Application No.

10/563,082

Examiner

Albert K. Wong

Applicant(s)

HUDSON, STEVEN MARTIN

Art Unit

2612

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to election filed 10/8/07.
2. ☒ The allowed claim(s) is/are 1-3, 5-12, 14-16, 18-24, and 33-36.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) ✓                                       | 5. <input type="checkbox"/> Notice of Informal Patent Application  |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413) ✓<br>Paper No./Mail Date <u>05-07</u> ✓ |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08) ✓<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment ✓                                      |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material             | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance                       |
|   | 9. <input type="checkbox"/> Other _____  |

1. This Office action is in response to the election filed October 8, 2007. Claims 1-3, 5-12, 14-16, 18-25, 27-29, and 32-38 are pending. Applicant's election of the invention of Group I without traverse is acknowledged. The remaining claims have been withdrawn from consideration. It is noted that claim 32 should have been subject to a restriction in the prior Office action. Applicant has agreed to cancel the claim, but reserves the right to file the claim in a divisional application.

#### **EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Donald Hill on December 5, 2007.

The application has been amended as follows:

Please cancel claims 25, 27-29, 32, and 37-38.

1. (Currently Amended) A method of downhole data communication in a producing well in which there is a flow path for a flow of produced product from the formation towards the surface, the data communication taking place between two locations in the flow path, at least one of which is downhole in the well, and the method comprising the steps of:

collecting the produced product from the formation and causing or allowing the produced product to flow toward the surface;

controlling a flow rate of the produced product at a first of the two locations in dependence on data to be transmitted;

detecting, at the second of the two locations, the effect of said controlling of the flow rate of the produced product at the first location; and

using the results of the detecting step to extract the data transmitted, wherein the step of controlling the flow rate of the produced product at the first of the two locations comprises modulating the flow rate so as to encode said data onto a carrier frequency that is below 0.1 Hz.

5. (Currently Amended) A method according to claim 1 comprising the further steps of: controlling a flow rate of the produced product at the second location in dependence on data to be transmitted;

detecting, at the first location, the effect of said controlling of the flow rate of the produced product at the second location; and

using the results of the detecting step at the first location to extract the data transmitted.

12. (Currently Amended) Downhole data communication apparatus for use in a producing well in which there is a flow path for a flow of produced product from the formation towards the surface and where the data communication takes place between two locations in the flow path, at least one of which is downhole in the well, the apparatus comprising:

means for collecting the produced product from the formation and causing or allowing the produced product to flow toward the surface;

a flow rate controller for controlling a flow rate of the produced product at a first of the two locations in dependence on data to be transmitted;

a detector disposed at the second of the two locations, for detecting the effect of controlling of the flow rate of the produced product at the first location; and

an analyzer to extract transmitted data using the output of the detector, wherein the flow rate controller is arranged to modulate the flow rate so as to encode said data onto a carrier frequency that is below 0.1 Hz.

14. (Currently Amended) Apparatus according to claim 36, in which the flow rate detector comprises a flow rate meter which comprises a chamber, an elongate orifice having one end in fluid communication with the chamber and another end exposable to the ingress of fluid from a fluid flow, the flow rate of which flow is to be measured, and a pressure sensor for sensing the pressure in the chamber.

18. (Currently Amended) Apparatus according to claim 12, further comprising:  
a second location flow rate controller for controlling a flow rate of the produced product at the second location in dependence on data to be transmitted from the second location;  
a first location detector for detecting, at the first location, the effect of controlling of the flow rate of the produced product at the second location; and  
an analyzer arranged to extract data transmitted from the second location using the output of the first location detector.

33. (Currently Amended) A method of downhole data communication in a producing well in which there is a flow path for a flow of product from the formation towards the surface, the data communication taking place between two locations in the flow path, at least one of which is downhole in the well, and the method comprising the steps of:  
collecting the produced product from the formation and causing or allowing the produced product to flow toward the surface;  
controlling a flow rate of the produced product at a first of the two locations in dependence on data to be transmitted;  
measuring, at the second of the two locations, the flow rate of the produced product to detect variations in flow rate of the produced product at the second location caused by said controlling of the flow rate of the produced product at the first location; and  
using the results of the measuring step to extract the data transmitted, the method comprising the further steps of altering the flow rate of the produced product at the first location by at least +/- 20% about an average flow rate to encode data to be transmitted and controlling

the flow rate of the produced product at the first location to apply tones to the flow having a frequency in the order of 0.1Hz or below.

34. (Currently Amended) Downhole data communication apparatus for use in a producing well in which there is a flow path for a flow of produced product from the formation towards the surface and where the data communication takes place between two locations in the flow path, at least one of which is downhole in the well, the apparatus comprising:

means for collecting the produced product from the formation and causing or allowing the produced product toward the surface;

a flow rate controller for controlling a flow rate of the produced product at a first of the two locations in dependence on data to be transmitted;

a flow rate detector disposed at the second of the two locations, for detecting the effect of controlling of the flow rate of the produced product at the first location; and

an analyzer to extract transmitted data using the output of the detector, wherein the flow rate controller is arranged for altering the flow rate of the produced product at the first location by at least +/- 20% about an average flow rate to encode data to be transmitted and moreover is arranged for controlling the flow rate of the produced product at the first location to apply tones to the flow having a frequency in the order of 0.1Hz or below.

35. (Currently Amended) A method according to claim 1, in which the detecting step comprises the step of measuring, at the second of the two locations, the flow rate of the produced product to detect variations in flow rate of the produced product at the second location caused by said controlling of the flow rate of the produced product at the first location.

3. Claims 1-3, 5-12, 14-16, 18-24, and 33-36 are allowed.

4. The following is an examiner's statement of reasons for allowance: The concept of modulating a fluid produced in a well for telemetry purpose is generally known. However, the prior art fails to provide any essential details to enable transmission of a signal by collecting a

produced product and by properly modulating the product so that the signal can be recovered.

The claims recite the step of encoding of data onto a carrier frequency that is below 0.1 Hz onto a collected, produced product or to apply tones to the flow of a collected, produced product having a frequency in the order of 0.1 Hz or below. Such a combination is not taught, suggested, or made obvious by the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert K. Wong whose telephone number is 571-272-3057. The examiner can normally be reached on M-Th.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian A. Zimmerman can be reached on 571-272-3059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:  
10/563,082  
Art Unit: 2612

Page 7

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Albert K. Wong  
December 5, 2007

  
ALBERT K. WONG  
PRIMARY EXAMINER